

REMARKS

A. Introduction

Claims 2-7, 9-13, 15-27, 29-37, 39-42, 85, 87, 89, 91, 93, 95, 97, 101 and 103 were pending in the application at the time of the Office Action. Claims 2-7, 9-13, 15-27, 29-37, 39-42, 85, 87, 89, 91, 93, 95, 97, 101 and 103 were rejected as being anticipated by and/or obvious over cited art. By this response applicant has amended the drawings to remedy a formality and has cancelled claim 11. As such, claims 2-7, 9, 10, 12, 13, 15-27, 29-37, 39-42, 85, 87, 89, 91, 93, 95, 97, 101 and 103 are presented for the Examiner's consideration in light of the following remarks.

B. Objections to the Drawings

Page 2 of the Office Action objects to the drawings based on a formality. Specifically, the Office Action asserts that Figures 37-40, 41A, and 41B should be designated as prior art. In view of amendments set forth herein to Figures 37-40, 41A, and 41B, Applicant respectfully submits that the objection to the drawings has been overcome and should be withdrawn.

C. Anticipation Rejection

Pages 3-24 of the Office Action reject claims 2-7 9-13, 15-27, 29-37, 39-42, 93, 95, and 99 under 35 USC § 102(b) as being anticipated by Tsutomu et al. "Novel Broad-band Optical Switch Using Silica-Based Planar Lightwave Circuit," ("*Tsutomu*"). Inasmuch as claim 11 has been canceled herein, the rejection of that claim has been rendered moot. Of the remaining rejected claims, claim 2 is the sole independent claim. Applicant respectfully traverses this rejection and submits that *Tsutomu* does not anticipate claims 2-7 9, 10, 12, 13, 15-27, 29-37, 39-

42, 93, 95, and 99 because *Tsutomu* does not include each and every claim limitation recited in the rejected claims.

Independent claim 2 recites that “at least one of said first optical multi/demultiplexing device and said second optical multi/demultiplexing device is a phase generating coupler, which produces a wavelength-dependent phase difference”; and “assuming that λ is the wavelength, $2\pi\phi_1(\lambda)$ is the phase produced by the first optical multi/demultiplexing device, $2\pi\phi_{\Delta L}(\lambda)$ is the phase difference of the optical delay line with an optical path length difference of ΔL , and $2\pi\phi_2(\lambda)$ is the phase produced by the second optical multi/demultiplexing device, the phase produced by the first and second optical multi/demultiplexing device and the optical path length difference ΔL is set such that the sum of the phase difference $2\pi\{\phi_1(\lambda) + \phi_{\Delta L}(\lambda) + \phi_2(\lambda)\}$ becomes wavelength insensitive.”

The Office Action asserts that *Tsutomu* discloses such an optical switch, asserting that the device disclosed in Figure 1 and the first full paragraph of col. 2 of page 735 of *Tsutomu* is substantively identical with the interferometer optical switch recited in claim 2. Based on this, the Office Action asserts that many of the limitations recited in the claims, including those underlined above, would be inherent to *Tsutomu*. Applicant respectfully disagrees.

The Examiner asserts that claim 2 is inherent to *Tsutomu* because *Tsutomu* teaches, in reference to Figure 1 and the first full paragraph in col. 2 on page 735, a wavelength insensitive device in which “the wavelength dependence can be compensated for by operating two subphase shifters.”

However, the wavelength dependence disclosed in *Tsutomu* refers to the wavelength dependence regarding the coupling ratio of the optical multi/demultiplexing devices (the 3 dB-wavelength insensitive couplers (WINC's) in *Tsutomu*). This is made clear by various portions

of *Tsutomu*, such as “its characteristics depend greatly on wavelength because 3-dB couplers ..., the fundamental elements of an MZI, have wavelength dependent coupling ratios” (2nd paragraph in col. 1 on page 735), and “[t]his wavelength dependence can be compensated for by operating two subphase shifters” (2nd paragraph in col. 2 on page 735). *Tsutomu* discloses that the coupling ratio of the WINC can be adjusted by changing the optical path length difference of two arm waveguides of WINC using the subphase shifter to effect the compensation.

The Office Action asserts that the two WINCs along with the main phase shifter region configuration shown in Fig. 1 of *Tsutomu* enable the control of the phase such that the claimed properties/functions exist in and/or are performed by the *Tsutomu* device. However, the phase mentioned in *Tsutomu* is related to the phase of the arm waveguide within the WINC, which is adjusted by the subphase shifters on the arm waveguide of the WINC. By operating the subphase shifters on the arm waveguide, the phase (the path length difference) of the arm waveguide changes, and the wavelength dependence of the coupling ratio of the WINC can be controlled. On the other hand, the claimed invention focuses on the output phase of the phase generating coupler, and is completely different from what *Tsutomu* refers to.

In view of the foregoing, Applicant submits that *Tsutomu* does not disclose the technical idea of reducing the wavelength dependence of the output power of the optical switch by use of the wavelength-dependent phase produced by the optical multi/demultiplexing devices (i.e., a phase generating coupler). That is to say, *Tsutomu* does not disclose or suggest “a phase generating coupler, which produces a wavelength-dependent phase difference,” as recited in claim 2.

Furthermore, Applicant respectfully notes that inherency is not readily established. For example, as noted in MPEP § 2112, the Examiner must provide rationale or evidence showing

inherency. In particular, “The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic.” *In re Rijckaert*, 9 F.3d 1531, 1534 28 USPQ 2d 1955, 1957 (Fed. Cir. 1993) (emphasis in original). Moreover, the Court of Appeals for the Federal Circuit has noted that “To establish inherency, the extrinsic evidence ‘must make clear that the missing descriptive matter is necessarily present in the thing described by the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a thing may result from a given set of circumstances is not sufficient’.” *In re Robertson*, 169 F.3d 743, 745, 49 USPQ 2d 1949, 1950-51 (Fed. Cir. 1999) (emphasis added).

Finally, “In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.” *Ex Parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original).

In light of the foregoing discussion, Applicant submits that the Office Action has not established the inherency of the above-referenced claim limitations. In fact, as noted above, the Applicant has identified a number of areas in which *Tsutomu* does not even teach similar structure or function as what the Office Action considers to be inherent in claim 2.

In view of the foregoing, Applicant respectfully requests that the anticipation rejection with respect to claim 2 be withdrawn. Claims 3-7 9-13, 15-27, 29-37, 39-42, 93, 95, and 99 depend from claim 2 and thus incorporate the limitations thereof. As such, applicant submits that claims 3-7 9-13, 15-27, 29-37, 39-42, 93, 95, and 99 are distinguished over the cited art for at least the same reasons as discussed above with regard to claim 2. Accordingly, Applicant

respectfully requests that the anticipation rejection with respect to claims 3-7 9-13, 15-27, 29-37, 39-42, 93, 95, and 99 also be withdrawn.

D. Obviousness Rejection

Pages 24-30 of the Office Action reject claims 85, 87, 89, 91, 97, 101 and 103 under 35 USC § 103(a) as being unpatentable over *Tsutomu*. Claims 85, 87, 89, 91, 97, 101 and 103 depend from claim 2 and thus incorporate the limitations thereof. As such, Applicant submits that claims 85, 87, 89, 91, 97, 101 and 103 are not obvious over *Tsutomu* for at least the same reasons as discussed above with regard to claim 2. Accordingly, Applicant respectfully requests that the obviousness rejection with regard to claims 85, 87, 89, 91, 97, 101 and 103 be withdrawn.

No other objections or rejections are set forth in the Office Action.

E. Conclusion

Applicant notes that this response does not discuss every reason why the claims of the present application are distinguished over the cited art. Most notably, applicant submits that many if not all of the dependent claims are independently distinguishable over the cited art. Applicant has merely submitted those arguments which it considers sufficient to clearly distinguish the claims over the cited art.

In view of the foregoing, applicant respectfully requests the Examiner's reconsideration and allowance of claims 2-7, 9, 10, 12, 13, 15-27, 29-37, 39-42, 85, 87, 89, 91, 93, 95, 97, 101 and 103 as amended and presented herein.

In the event there remains any impediment to allowance of the claims which could be clarified in a telephonic interview, the Examiner is respectfully requested to initiate such an interview with the undersigned.

Dated this 19th day of May 2008.

Respectfully submitted,

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